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Holly T. Kefauver

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Applicant: Robb R. Gardner et al : Paper No.:
Serial No.: 09/778,678 : Group Art Unit: 1771
Filing Date: February 7, 2001 : Examiner: L. Salvatore

For: **Enhanced Fabric Comprising Substrates and Process to Provide Same**

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The present Appeal Brief is submitted in support of the Notice of Appeal filed by Certificate of Mail on September 22, 2003 and received by the U.S. Patent and Trademark Office on September 25, 2003.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is the assignee of the present application, The Procter & Gamble Company.

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II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to the Appellants, the Appellants' undersigned legal representative or the assignee which are believed to directly effect or be directly effected by or having a bearing on the Board's decision in the present appeal.

III. STATUS OF THE CLAIMS

Claims 1-24 are pending and stand rejected. A complete copy of the pending claims is set forth in the Appendix.

IV. STATUS OF AMENDMENT FILED SUBSEQUENT TO REJECTION ON APPEAL

No amendment was submitted to final rejection. A Request for Reconsideration was filed by certificate of mailing on September 22, 2003 but did not contain any claim amendments. An Advisory Action was mailed November 20, 2003, according to the U.S. Patent and Trademark Office PAIR system, but has not yet been received.

V. SUMMARY OF THE INVENTION

The present invention relates to treated substrates, articles of manufacture and processes for providing enhanced benefits to a fabric fiber (claims 1, 23 and 24, respectively).

More particularly, claim 1 is directed to a substrate comprising fabric and treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst. The treated substrate has at least three enhanced fabric benefits selected from the group consisting of durable press, as compared with untreated fabric; hand feel, as compared with untreated fabric; anti-abrasion, as compared with fabric treated with formaldehyde and catalyst in the absence of said polyethylene glycol; anti-shrinking, as compared with untreated fabric; and anti-

yellowing, as compared with at least one of untreated fabric and fabric treated with formaldehyde and catalyst in the absence of said polyethylene glycol.

Claims 2-4 further define the polyethylene glycol as having a molecular weight of from about 800 gm/mol to about 1900 gm/mol, from about 900 gm/mol to about 1200 gm/mol, and about 1000 gm/mol, respectively.

Claims 5 and 6 define the composition as comprising from about 2% to about 12% by weight, of formaldehyde, and from about 4% to about 8% by weight, of formaldehyde, respectively. Claims 7 and 8 define the composition as comprising from about 1% to about 10% by weight, of polyethylene glycol, and from about 2% to about 8% by weight, of polyethylene glycol, respectively. Claims 9-11 define the composition as comprising from about 1% to about 12% by weight, of said catalyst, and from about 1% to about 9% by weight, of said catalyst, and about 5% by weight, of said catalyst, respectively.

According to claim 12, the catalyst is selected from the group consisting of mineral acids, salts of strong acids, organic acids, ammonium salts, alkylamine salts, and mixtures thereof. According to claim 13, the catalyst is magnesium chloride, aluminum chloride, citric acid, or mixtures thereof.

Claim 14 recites that the composition further comprises from 0.01% to 1% by weight, of a nonionic surfactant.

Claims 15-17 recite that the substrate has a durable press benefit of about 3, about 3.25 and about 3.5, respectively, after 1 washing. Claims 18-20 recite that the substrate has a durable press benefit of about 3, about 3.25 and about 3.5, respectively, after 5 washings. Claims 21 and 22 recite that the fabric has an Anti-shrinkage Rating of less than 10% after 1 washing, and less than 5% after 5 washings, respectively.

Claim 23 is directed to an article of manufacture comprising fabric made up of woven or non-woven fibers. The fabric has at least three enhanced fabric benefits selected from the

group consisting of durable press, as compared with fabric made up of untreated fibers; hand feel, as compared with fabric made up of untreated fibers; anti-abrasion, as compared with fabric made up of fibers treated with formaldehyde and catalyst in the absence of polyethylene glycol; anti-shrinking, as compared with fabric made up of untreated fibers; and anti-yellowing, as compared with at least one of fabric made up of untreated fibers and fabric made up of fibers treated with formaldehyde and catalyst in the absence of polyethylene glycol. The benefits are achieved by treating the fibers with a composition comprising formaldehyde; polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol; and an acid catalyst.

Claim 24 is directed to a process for providing at least three enhanced benefits to a fabric fiber-comprising substrate. The benefits are selected from the group consisting of durable press, as compared with untreated fabric fiber-comprising substrate; hand feel, as compared with untreated fabric fiber-comprising substrate; anti-abrasion, as compared with fabric fiber-comprising substrate treated with formaldehyde and catalyst in the absence of polyethylene glycol; anti-shrinking, as compared with untreated fabric fiber-comprising substrate; and anti-yellowing, as compared with at least one of untreated fabric fiber-comprising substrate and fabric fiber-comprising substrate treated with formaldehyde and catalyst in the absence of polyethylene glycol. The process comprises the steps of treating a fabric fiber-comprising substrate with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst; and curing the composition on the surface of the substrate.

VI. ISSUES ON APPEAL

The following two issues are presented on appeal for review by the Board:

A. The rejection of claims 1-4, 7, 8, 12 and 15-24 under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over, the Tukumi Japanese Publication 05-059664.

B. The rejection of claims 5, 6 and 9-14 under 35 U.S.C. §103(a) as unpatentable over Tukumi and further in view of the Payet published PCT International Application WO 99/58758.

VII. GROUPING OF THE CLAIMS

A. With respect to issue A. set forth above, Applicants admit that claims 2-4, 7 and 8 stand or fall together with claim 1 from which they depend. However, Applicants submit that claims 1, 23 and 24 are independently patentable from one another, and that claims 12 and 15-22 are independently patentably distinguishable from claim 1 from which they depend. Reasons in support of this independent patentability are set forth in detail below.

B. With respect to issue B. set forth above, Applicants submit that claims 5, 9, 12 and 14 are all independently patentable from one another. Additionally, Applicants submit that claim 6 is independently patentable from claim 5 from which it depends, claims 10 and 11 are each independently patentable from claim 9 from which they depend, and claim 13 is independently patentable from claim 12 from which it depends. Reasons in support of the independent patentability of these claims are set forth in detail below.

VIII. ARGUMENTS

As will be set forth in detail below, the substrates defined by claims 1-4, 7, 8, 12 and 15-24, the article of manufacture defined by claim 23 and the process defined by claim 24 are neither anticipated by nor rendered obvious over Tukumi. Additionally, the substrates

defined by claims 5, 6 and 9-14 are nonobvious over and patentably distinguishable from Tukumi in view of Payet. Accordingly, the rejections under 35 U.S.C. §§ 102 and 103 should be reversed. Favorable action by the Board is respectfully requested.

A. The Invention

According to claim 1, the invention is directed to a substrate comprising fabric. The substrate is treated with a composition comprising a) formaldehyde, b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst. The treated substrate has at least three enhanced fabric benefits selected from the group consisting of i) durable press, as compared with untreated fabric; ii) hand feel, as compared with untreated fabric; iii) anti-abrasion, as compared with fabric treated with formaldehyde and catalyst in the absence of said polyethylene glycol; iv) anti-shrinking, as compared with untreated fabric; and v) anti-yellowing, as compared with at least one of untreated fabric and fabric treated with formaldehyde and catalyst in the absence of said polyethylene glycol.

According to claim 23, the invention is directed to an article of manufacture comprising fabric made up of woven or non-woven fibers. The fabric has at least three enhanced fabric benefits selected from the group consisting of i) durable press, as compared with fabric made up of untreated fibers; ii) hand feel, as compared with fabric made up of untreated fibers; iii) anti-abrasion, as compared with fabric made up of fibers treated with formaldehyde and catalyst in the absence of polyethylene glycol; iv) anti-shrinking, as compared with fabric made up of untreated fibers; and v) anti-yellowing, as compared with at least one of fabric made up of untreated fibers and fabric made up of fibers treated with formaldehyde and catalyst in the absence of polyethylene glycol. The benefits are achieved by treating said fibers with a composition comprising a) formaldehyde, b) polyethylene

glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst.

Finally, according to claim 24, the invention is directed to a process for providing at least three enhanced benefits to a fabric fiber-comprising substrate. The benefits are selected from the group consisting of i) durable press, as compared with untreated fabric fiber-comprising substrate; ii) hand feel, as compared with untreated fabric fiber-comprising substrate; iii) anti-abrasion, as compared with fabric fiber-comprising substrate treated with formaldehyde and catalyst in the absence of polyethylene glycol; iv) anti-shrinking, as compared with untreated fabric fiber-comprising substrate; and v) anti-yellowing, as compared with at least one of untreated fabric fiber-comprising substrate and fabric fiber-comprising substrate treated with formaldehyde and catalyst in the absence of polyethylene glycol. The process comprises the steps of treating a fabric fiber comprising substrate with a composition comprising a) formaldehyde, b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst, and curing said composition on the surface of said substrate.

As set forth in the present specification, for example at page 2, beginning at line 8, many conventional improvements or enhancements to fabric are accompanied by disadvantageous consequences. For example, various processes which provide permanent press properties require strong acidic conditions which can significantly reduce fabric strength. The addition of anti-static or softening agents can cause fabric to prematurely abrade. On the other hand, the present invention provides fabric substrates and articles of manufacture which exhibit combinations of improved properties, so that enhancements are not accompanied by unacceptable fabric property degradation.

B. Claims 1-4, 7, 8, 12 and 15-24 are Neither Anticipated by Nor Rendered Obvious Over Tukumi

The substrates defined by claims 1-4, 7, 8, 12 and 15-22, the article of manufacture defined by claim 23 and the process defined by claim 24 are neither anticipated by nor rendered obvious over Tukumi.

1. The Rejection

In rejecting claims 1-4, 7, 8, 12 and 15-24 as anticipated by or obvious over Tukumi, the Examiner asserted that Takumi discloses a fiber finishing method which includes immersing a cellulosic fabric in a solution of polyethylene glycol having a molecular weight ranging from 90-5000 gm/mol, drying the fabric, exposing the fabric to formaldehyde vapor in the presence of a catalyst and heat curing. The Examiner further asserted that the claimed properties are inherent in the invention of Takumi since Takumi uses like materials and like processes.

2. The Claims are Not Anticipated by Tukumi

Contrary to the Examiner's assertions, Tukumi does not teach like materials and like processes, whereby the Examiner's assumptions regarding the inherency of the presently claimed enhanced benefits in Tukumi are in error.

More particularly, Takumi discloses a method for resin finishing of a fiber product. A cellulosic fiber product is immersed in an aqueous solution of a polyhydric alcohol, uniformly dried, exposed to formaldehyde vapor and then provided with a catalyst such as sulfur dioxide gas and heat treated. Takumi discloses that ethylene glycol or polyethylene glycol having 90-5000 molecular weight are preferred and that the amount of the remaining formaldehyde is suppressed to a low content to provide wrinkle preventing properties and shrink preventing properties without reducing strength.

However, Applicants find no teaching or suggestion by Takumi of a substrate or fibers treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst, as required by claims 1 and 23, respectively. Similarly, Applicants find no teaching or suggestion by Takumi of a process wherein a substrate is treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst, as required by claim 24. Rather, Takumi discloses sequential steps of treatment with a polyhydric alcohol, followed by exposure to formaldehyde vapor, followed by provision of a gaseous catalyst. Thus, contrary to the Examiner's assertions, Takumi does not disclose a like process as Takumi employs a formaldehyde vapor contact step, separate from the polyhydric alcohol treatment step, followed by yet another separate gaseous catalyst treatment step. In fact, in the Official Action dated June 20, 2003, the Examiner admits that Takumi teach a different process (page 3, last line).

One skilled in the art will appreciate that a method as taught by Takumi, wherein polyhydric alcohol treatment is followed by exposure to formaldehyde vapor, followed by gaseous catalyst exposure, can result in differing degrees of formaldehyde crosslinking as the amount of formaldehyde contact with the cellulosic fibers is limited both by the polyhydric alcohol pretreatment and the vapor phase of the formaldehyde. In fact, Takumi indicates that formaldehyde on the product is suppressed to a low amount. Additionally, the extent of crosslinking can be effected by the amount of catalyst contact from the vapor phase. Accordingly, it cannot be assumed that the product of Takumi will have properties exhibited by the presently claimed substrates and articles of manufacture, and particularly at least three enhanced fabric benefits, or that the different process of Takumi will provide such a product.

The Examiner asserted that Applicants are claiming a composition, not the amounts of each constituent used or present in the final product structure. However, Applicants are not merely claiming compositions. To the contrary, Applicants are claiming a substrate comprising fabric (claim 1) or an article of manufacture comprising fibers (claim 23) treated with a composition comprising a) formaldehyde, b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst, and having at least three enhanced fabric benefits selected from a specified group of benefits. The recited benefits result from the specified treatment with the specified composition. Takumi does not teach the treatment composition of claim 1 or claim 23, nor the treatment process of claim 1 or claim 23, nor the combination of benefits required by claim 1 or claim 23. Moreover, Takumi does not teach modifying the disclosed treatment process, particularly to result in a substrate or article of manufacture having the combination of benefits of claim 1 or claim 23. In fact, the modifications of Takumi necessary to result in the limitations of claim 1 or claim 23 are contrary to the sequential steps of Takumi and contrary to the low formaldehyde use obtained by the formaldehyde vapor treatment of Takumi.

Finally, the invention is directed to a process for providing at least three enhanced benefits selected from a specified group to a fabric fiber-comprising substrate by treating a fabric fiber comprising substrate with a composition comprising a) formaldehyde, b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst, and curing said composition on the surface of said substrate (claim 24). Again, Applicants are not merely claiming a composition as asserted by the Examiner. Rather, Applicants are claiming a process to provide specified benefits, which process employs defined steps and composition. Takumi does not teach the process of obtaining the claimed combination of benefits, nor the recited steps, nor the recited treatment composition. Moreover, as noted above, Takumi does not teach modifying the disclosed

sequential treatment process, particularly to result in a fabric substrate having the claimed combination of benefits of claim 24. In fact, as noted above, the modifications of Takumi necessary to result in the process of claim 24 are contrary to the sequential steps of Takumi and contrary to the low formaldehyde use obtained by the formaldehyde vapor treatment of Takumi.

It is not surprising then that Applicants find no teaching or suggestion by Takumi regarding substrates or articles of manufacture as recited in claims 1 and 23, exhibiting at least three enhanced benefits selected from the group consisting of i) durable press, ii) hand feel, iii) anti-abrasion, iv) anti-shrinking, and v) anti-yellowing, or a process for providing such as recited in claim 24. Moreover, in view of the process and compositional differences discussed above, it cannot be assumed that the sequential method and formaldehyde vapor teachings of Takumi inherently result in such a product.

Anticipation under 35 U.S.C. §102 requires that each and every element as set forth in the claims is found, either expressly or inherently described, in a single prior art reference, *In re Robertson*, 49 U.S.P.Q.2d 1949, 1950 (Fed Cir. 1999). In view of the failure of Takumi to disclose substrates or articles treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst as required by the present claims, or provision of at least three enhanced benefits selected from the group consisting of i) durable press, ii) hand feel, iii) anti-abrasion, iv) anti-shrinking, and v) anti-yellowing, Takumi does not expressly or inherently describe each and every element as set forth in the claims. Thus, Takumi does not anticipate claims 1-4, 7, 8, 12 and 15-24 under 35 U.S.C. §102. The rejection of claims 1-4, 7, 8, 12 and 15-24 under 35 U.S.C. §102 should therefore be reversed.

3. The Claims are Not Rendered Obvious by Takumi

In order to render a claimed invention obvious, the prior art must enable one skilled in the art to make and use the claimed invention, *Motorola, Inc. v. Interdigital Tech. Corp.*, 43 U.S.P.Q.2d 1481, 1489 (Fed. Cir. 1997). In view of the failure of Takumi to disclose the treatment composition as presently claimed, a treatment process as presently claimed, or any motivation for modifying the Takumi process to obtain the combinations of benefits as presently claimed in a substrate comprising treated fabric or an article of manufacture comprising fabric made up of woven or non-woven fibers, Takumi does not enable one skilled in the art to make and use the presently claimed invention. In fact, it is error to find obviousness where references diverge from and teach away from the invention at hand, *In re Fine*, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). As the modifications of Takumi necessary to result in the substrate of claim 1, the article of manufacture of claim 23 or the process of claim 24 are contrary to the sequential steps of Takumi and contrary to the low formaldehyde use obtained by the formaldehyde vapor treatment of Takumi, it is error to find the presently claimed invention obvious in view of Takumi. Thus, Takumi does not render claims 1-4, 7, 8, 12 and 15-24 obvious under 35 U.S.C. §103. The rejection of claims 1-4, 7, 8, 12 and 15-24 under 35 U.S.C. §103 should therefore be reversed.

4. Claim 12 is Further Patentably Distinguishable

Claim 12 is directed to a substrate treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst selected from a group consisting of mineral acids, salts of strong acids, organic acids, ammonium salts, alkyl amine salts, and mixtures thereof. Takumi et al disclose a sequential treatment process wherein a dried cloth having been exposed to formaldehyde vapor is provided with a catalyst such as sulfur dioxide gas.

Applicants find no teaching or suggestion by Takumi of substrates treated with a catalyst as required by claim 12.

Thus, Takumi does not disclose each and every element of claim 12 and therefore does not anticipate claim 12 under 35 U.S.C. §102. The rejection of claim 12 under 35 U.S.C. §102 should therefore be reversed.

5. Claims 15-22 are Further Patentably Distinguishable

Claims 15-17 recite that the substrate according to claim 1 has a durable press benefit of about 3, of about 3.25 and of about 3.5, respectively, after one washing. Claims 18-20 recite that the substrate according to claim 1 has a durable press benefit of about 3, of about 3.25 and of about 3.5, respectively, after five washings. Claim 21 recites that the substrate fabric has an anti-shrinkage rating of less than 10% after one washing, while claim 22 recites that the substrate fabric has an anti-shrinkage rate of less than 5% after five washings. Thus, these claims each recite a more specific enhanced benefit which is provided to the substrate in combination with at least two additional benefits as recited in claim 1.

Applicants find no teaching or suggestion by Takumi relating to substrates having the specific benefit defined in any of claims 15-22. Moreover, in view of the differences between the process described by Takumi et al and the process set forth in the present specification, as discussed in detail above, it cannot be assumed that the Takumi process renders the specific benefits recited in each of claims 15-22, particularly in combination with at least two additional enhanced benefits as required by claim 1. Moreover, Applicants find no teaching or suggestion by Takumi which would lead one of ordinary skill in the art to obtain the specific benefits recited in each of claims 15-22, particularly in combination with at least two additional enhanced benefits as recited in claim 1. Thus, Takumi fails to anticipate or render obvious any of the substrates defined by claims 15-22. The rejection of

claims 15-22 under 35 U.S.C. §102 or, in the alternative, under 35 U.S.C. §103, should therefore be reversed.

C. **Claim 5, 6 and 9-14 are Nonobvious Over Takumi and Payet**

The substrates defined by claims 5, 6 and 9-14 are nonobvious over and patentably distinguishable from the combination of Takumi and Payet.

1. **The Rejection**

The Examiner asserted that Payet teaches the use of a composition comprising formaldehyde, a catalyst and a silicone elastomer. The Examiner further asserted that it would have been obvious to one skilled in the art to use the specific catalyst of Payet, to use a higher amount of catalyst than taught by Payet, and to use the formaldehyde solution of Payet in the invention of Takumi. In reply to Applicants' previous arguments, the Examiner asserted that Payet teaches using less formaldehyde than other known processes and further teaches removing residual formaldehyde.

2. **The Claims are Nonobvious Over Takumi and Payet**

Claim 5, 6 and 9-14 depend directly or indirectly from claim 1. The deficiencies of Takumi with respect to claim 1 are discussed in detail above. Specifically, Applicants find no teaching or suggestion by Takumi of a substrate treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst. Similarly, Applicants find no teaching or suggestion by Takumi of a treated substrate having at least three enhanced fabric benefits selected from the group consisting of durable press, hand feel, anti-abrasion, anti-shrinking and anti-yellowing, as recited in claim 1. Moreover, Applicants find no teaching or suggestion by Takumi of the specific limitations of any of claims 5, 6 and 9-14. Further, the deficiencies of Takumi with respect to these claims are not resolved by Payet.

More particularly, claims 5 and 6 are directed to substrates treated with a composition comprising from about 2% to about 12% by weight, and from about 4% to about 8% by weight, respectively, of formaldehyde. Applicants find no teaching by Takumi et al relating to a substrate treated with a composition comprising either from about 2% to about 12% by weight of formaldehyde or from about 4% to about 8% by weight of formaldehyde, particularly in combination with polyethylene glycol and an acid catalyst as required by claims 5 and 6. To the contrary, Takumi teaches sequential treatment steps wherein a formaldehyde vapor is employed subsequent to treatment with a polyethylene glycol or ethylene glycol treatment and prior gaseous catalyst treatment.

Claims 9-11 are directed to substrates treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol and an acid catalyst in the amount of from about 1% to about 12% by weight, from about 1% to about 9% by weight, and from about 5% by weight, respectively. Applicants find no teaching or suggestion by Takumi of a substrate or product treated with such a composition. To the contrary, as noted above, Takumi discloses sequential treatment steps wherein a dried cloth, having been exposed to formaldehyde vapor, is then contacted with a catalyst such as sulfur dioxide gas.

Claims 12 and 13 are directed to substrates treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst selected from a group consisting of mineral acids, salts of strong acids, organic acids, ammonium salts, alkyl amine salts, and mixtures thereof (claim 12), or wherein the catalyst is magnesium chloride, aluminum chloride, citric acid, or mixtures thereof (claim 13). Takumi discloses a sequential treatment process wherein a dried cloth having been exposed to formaldehyde vapor is provided with a catalyst such as sulfur

dioxide gas. Applicants find no teaching or suggestion by Takumi of substrates treated with a catalyst as required by either claim 12 or claim 13.

Finally, claim 14 is directed to a substrate treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, an acid catalyst and from 0.01 to 1% by weight of a nonionic surfactant. Applicants find no teaching or suggestion by Takumi of a substrate treated with such a composition, particularly comprising from 0.01% to 1% by weight of a nonionic surfactant in combination with formaldehyde, polyethylene glycol and an acid catalyst.

These deficiencies of Takumi are not resolved by Payet. Initially, one skilled in the art would not find it obvious to combine the teachings of Payet with Takumi. Particularly, one skilled in the art would not find it obvious to use a liquid formaldehyde treatment solution as taught by Payet in the formaldehyde vapor process of Takumi. That is, Takumi has as an objective to provide a product using formaldehyde vapor to suppress formaldehyde to a low content. Accordingly, use of a liquid formaldehyde treatment solution as taught by Payet would encourage greater formaldehyde-fabric contact and therefore would be contrary to the objective of Takumi. Thus, one skilled in the art would not find it obvious to modify Takumi along the lines asserted by the Examiner and such a modification would be in opposition to the teachings of Takumi. Accordingly, Payet is not properly combinable with and therefore does not resolve the deficiencies of Takumi.

The Examiner has asserted that Payet teaches using less formaldehyde than other known processes and further teaches removing residual formaldehyde. Specifically, Payet teaches that less formaldehyde remains after the treatment process is complete as compared with other known processes (page 8, lines 14-17). Payet does not indicate what other known processes are being compared and specifically Payet does not compare his liquid treatment process with vapor formaldehyde treatment processes as employed by Takumi. To the

contrary, much of the related art described in the background portion of Payet relates to liquid treatments. Thus, Payet provides no teaching or suggestion to motivate one of ordinary skill in the art to employ any of the formaldehyde-containing compositions of Payet in the Takumi process along the lines asserted by the Examiner.

Finally, while Payet discloses compositions of formaldehyde, a catalyst and a silicone elastomer for treatment of fabric, Applicants find no teaching by Payet of compositions comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst as required by the present claims. Similarly, Applicants find no teaching by Payet of fabric which is treated with such compositions to provide at least three enhanced benefits selected from the group consisting of i) durable press, ii) hand feel, iii) anti-abrasion, iv) anti-shrinking, and v) anti-yellowing, as required by claims 5, 6 and 9-14. Additionally, Applicants find no teaching or suggestion by Payet for modifying the process of Takumi to provide a substrate treated with compositions defined by any of claims 5, 6 and 9-14.

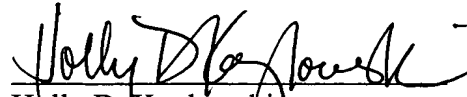
The mere fact that prior art could be modified to result in a claimed invention would not have made the modification obvious unless the prior art suggested the desirability of the modification, *In re Mills*, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990). Applicants find no suggestion in Payet regarding a desirability of modifying Takumi along the lines asserted by the Examiner. Thus, the asserted modifications of Takumi are not rendered obvious by Payet. The substrates of claims 5, 6 and 9-14 are therefore nonobvious over and patentably distinguishable from the combination of Takumi and Payet. Accordingly, the rejection of these claims under 35 U.S.C. §103 should be reversed.

IV. CONCLUSIONS

For the reasons discussed in detail above, Applicants submit that the substrates, article of manufacture and processes defined by claims 1-24 are neither anticipated by nor rendered

obvious over Takumi, or Takumi in combination with Payet. Accordingly, the rejection of claims 1-4, 7, 8, 12 and 15-24 under 35 U.S.C. §102 or §103 and the rejection of claims 5, 6 and 9-14 under 35 U.S.C. §103 should be reversed. Favorable action by the Board is respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Holly D. Kozlowski", written over a horizontal line.

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APPENDIX

1. A substrate comprising fabric, the substrate treated with a composition comprising:

- a) formaldehyde;
- b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol; and
- c) an acid catalyst;

wherein the treated substrate has at least three enhanced fabric benefits, said benefits selected from the group consisting of:

- i) durable press, as compared with untreated fabric;
- ii) hand feel, as compared with untreated fabric;
- iii) anti-abrasion, as compared with fabric treated with formaldehyde and catalyst in the absence of said polyethylene glycol;
- iv) anti-shrinking, as compared with untreated fabric; and
- v) anti-yellowing, as compared with at least one of untreated fabric and fabric treated with formaldehyde and catalyst in the absence of said polyethylene glycol.

2. A substrate according to Claim 1 wherein said composition comprises polyethylene glycol having a molecular weight of from about 800 gm/mol to about 1900 gm/mol.

3. A substrate according to Claim 2 wherein said composition comprises polyethylene glycol having a molecular weight of from about 900 gm/mol to about 1200 gm/mol.

4. A substrate according to Claim 3 wherein said composition comprises polyethylene glycol having a molecular weight of about 1000 gm/mol.

5. A substrate according to Claim 1 wherein said composition comprises from about 2% to about 12% by weight, of formaldehyde.

6. A substrate according to Claim 5 wherein said composition comprises from about 4% to about 8% by weight, of formaldehyde.

7. A substrate according to Claim 1 wherein said composition comprises from about 1% to about 10% by weight, of polyethylene glycol.

8. A substrate according to Claim 7 wherein said composition comprises from about 2% to about 8% by weight, of polyethylene glycol.

9. A substrate according to Claim 1 wherein said composition comprises from about 1% to about 12% by weight, of said catalyst.

10. A substrate according to Claim 9 wherein said composition comprises from about 1% to about 9% by weight, of said catalyst.

11. A substrate according to Claim 10 wherein said composition comprises about 5% by weight, of said catalyst.

12. A substrate according to Claim 1 wherein said catalyst is selected from the group consisting of mineral acids, salts of strong acids, organic acids, ammonium salts, alkylamine salts, and mixtures thereof.

13. A substrate according to Claim 12 wherein said catalyst is magnesium chloride, aluminum chloride, citric acid, or mixtures thereof.

14. A substrate according to Claim 1 wherein said composition further comprises from 0.01% to 1% by weight, of a nonionic surfactant.

15. A substrate according to Claim 1 having a durable press benefit of about 3 after 1 washing.

16. A substrate according to Claim 15 having a durable press benefit of about 3.25 after 1 washing.

17. A substrate according to Claim 16 having a durable press benefit of about 3.5 after 1 washing.

18. A substrate according to Claim 1 having a durable press benefit of about 3 after 5 washings.

19. A substrate according to Claim 18 having a durable press benefit of about 3.25 after 5 washings.

20. A substrate according to Claim 19 having a durable press benefit of about 3.5 after 5 washings.

21. A substrate according to Claim 1 wherein said fabric has a Anti-shrinkage Rating of less than 10% after 1 washing.

22. A substrate according to Claim 21 wherein said fabric has a Anti-shrinkage Rating of less than 5% after 5 washings.

23. An article of manufacture comprising fabric made up of woven or non-woven fibers, the fabric having at least three enhanced fabric benefits, said benefits selected from the group consisting of:

- i) durable press, as compared with fabric made up of untreated fibers;
- ii) hand feel, as compared with fabric made up of untreated fibers;
- iii) anti-abrasion, as compared with fabric made up of fibers treated with formaldehyde and catalyst in the absence of polyethylene glycol;

- iv) anti-shrinking, as compared with fabric made up of untreated fibers;

and

- v) anti-yellowing, as compared with at least one of fabric made up of untreated fibers and fabric made up of fibers treated with formaldehyde and catalyst in the absence of polyethylene glycol;

wherein said benefits are achieved by treating said fibers with a composition comprising:

- a) formaldehyde;

b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol; and

c) an acid catalyst.

24. A process for providing at least three enhanced benefits to a fabric fiber-comprising substrate, said benefits selected from the group consisting of:

i) durable press, as compared with untreated fabric fiber-comprising substrate;

ii) hand feel, as compared with untreated fabric fiber-comprising substrate;

iii) anti-abrasion, as compared with fabric fiber-comprising substrate treated with formaldehyde and catalyst in the absence of polyethylene glycol;

iv) anti-shrinking, as compared with untreated fabric fiber-comprising substrate; and

v) anti-yellowing, as compared with at least one of untreated fabric fiber-comprising substrate and fabric fiber-comprising substrate treated with formaldehyde and catalyst in the absence of polyethylene glycol;

wherein said process comprises the steps of:

A) treating a fabric fiber-comprising substrate with a composition comprising:

a) formaldehyde;

b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol; and

c) an acid catalyst; and

B) curing said composition on the surface of said substrate.

Image 1771
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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Applicant: Robb R. Gardner et al : Paper No.:
Serial No.: 09/778,678 : Group Art Unit: 1771
Filing Date: February 7, 2001 : Examiner: L. Salvatore

For: **Enhanced Fabric Comprising Substrates and Process to Provide Same**

TRANSMITTAL OF APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Submitted herewith in **triplicate** is an Appeal Brief in support of the Notice of Appeal filed by Certificate of Mailing on September 22, 2003 and received by the U.S. Patent and Trademark Office on September 25, 2003. The government fee in the amount of \$330.00 for filing the present Appeal Brief should be charged to our Visa credit card. Form PTO-2038 is enclosed.

Please charge any additional fees required or credit any excess in fees paid in connection with the present communication to Deposit Account No. 04-1133.

Respectfully submitted,



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Holly D. Kofman

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APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The present Appeal Brief is submitted in support of the Notice of Appeal filed by Certificate of Mail on September 22, 2003 and received by the U.S. Patent and Trademark Office on September 25, 2003.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is the assignee of the present application, The Procter & Gamble Company.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to the Appellants, the Appellants' undersigned legal representative or the assignee which are believed to directly effect or be directly effected by or having a bearing on the Board's decision in the present appeal.

III. STATUS OF THE CLAIMS

Claims 1-24 are pending and stand rejected. A complete copy of the pending claims is set forth in the Appendix.

IV. STATUS OF AMENDMENT FILED SUBSEQUENT TO REJECTION ON APPEAL

No amendment was submitted to final rejection. A Request for Reconsideration was filed by certificate of mailing on September 22, 2003 but did not contain any claim amendments. An Advisory Action was mailed November 20, 2003, according to the U.S. Patent and Trademark Office PAIR system, but has not yet been received.

V. SUMMARY OF THE INVENTION

The present invention relates to treated substrates, articles of manufacture and processes for providing enhanced benefits to a fabric fiber (claims 1, 23 and 24, respectively).

More particularly, claim 1 is directed to a substrate comprising fabric and treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst. The treated substrate has at least three enhanced fabric benefits selected from the group consisting of durable press, as compared with untreated fabric; hand feel, as compared with untreated fabric; anti-abrasion, as compared with fabric treated with formaldehyde and catalyst in the absence of said polyethylene glycol; anti-shrinking, as compared with untreated fabric; and anti-

yellowing, as compared with at least one of untreated fabric and fabric treated with formaldehyde and catalyst in the absence of said polyethylene glycol.

Claims 2-4 further define the polyethylene glycol as having a molecular weight of from about 800 gm/mol to about 1900 gm/mol, from about 900 gm/mol to about 1200 gm/mol, and about 1000 gm/mol, respectively.

Claims 5 and 6 define the composition as comprising from about 2% to about 12% by weight, of formaldehyde, and from about 4% to about 8% by weight, of formaldehyde, respectively. Claims 7 and 8 define the composition as comprising from about 1% to about 10% by weight, of polyethylene glycol, and from about 2% to about 8% by weight, of polyethylene glycol, respectively. Claims 9-11 define the composition as comprising from about 1% to about 12% by weight, of said catalyst, and from about 1% to about 9% by weight, of said catalyst, and about 5% by weight, of said catalyst, respectively.

According to claim 12, the catalyst is selected from the group consisting of mineral acids, salts of strong acids, organic acids, ammonium salts, alkylamine salts, and mixtures thereof. According to claim 13, the catalyst is magnesium chloride, aluminum chloride, citric acid, or mixtures thereof.

Claim 14 recites that the composition further comprises from 0.01% to 1% by weight, of a nonionic surfactant.

Claims 15-17 recite that the substrate has a durable press benefit of about 3, about 3.25 and about 3.5, respectively, after 1 washing. Claims 18-20 recite that the substrate has a durable press benefit of about 3, about 3.25 and about 3.5, respectively, after 5 washings. Claims 21 and 22 recite that the fabric has an Anti-shrinkage Rating of less than 10% after 1 washing, and less than 5% after 5 washings, respectively.

Claim 23 is directed to an article of manufacture comprising fabric made up of woven or non-woven fibers. The fabric has at least three enhanced fabric benefits selected from the

group consisting of durable press, as compared with fabric made up of untreated fibers; hand feel, as compared with fabric made up of untreated fibers; anti-abrasion, as compared with fabric made up of fibers treated with formaldehyde and catalyst in the absence of polyethylene glycol; anti-shrinking, as compared with fabric made up of untreated fibers; and anti-yellowing, as compared with at least one of fabric made up of untreated fibers and fabric made up of fibers treated with formaldehyde and catalyst in the absence of polyethylene glycol. The benefits are achieved by treating the fibers with a composition comprising formaldehyde; polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol; and an acid catalyst.

Claim 24 is directed to a process for providing at least three enhanced benefits to a fabric fiber-comprising substrate. The benefits are selected from the group consisting of durable press, as compared with untreated fabric fiber-comprising substrate; hand feel, as compared with untreated fabric fiber-comprising substrate; anti-abrasion, as compared with fabric fiber-comprising substrate treated with formaldehyde and catalyst in the absence of polyethylene glycol; anti-shrinking, as compared with untreated fabric fiber-comprising substrate; and anti-yellowing, as compared with at least one of untreated fabric fiber-comprising substrate and fabric fiber-comprising substrate treated with formaldehyde and catalyst in the absence of polyethylene glycol. The process comprises the steps of treating a fabric fiber-comprising substrate with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst; and curing the composition on the surface of the substrate.

VI. ISSUES ON APPEAL

The following two issues are presented on appeal for review by the Board:

A. The rejection of claims 1-4, 7, 8, 12 and 15-24 under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over, the Tukumi Japanese Publication 05-059664.

B. The rejection of claims 5, 6 and 9-14 under 35 U.S.C. §103(a) as unpatentable over Tukumi and further in view of the Payet published PCT International Application WO 99/58758.

VII. GROUPING OF THE CLAIMS

A. With respect to issue A. set forth above, Applicants admit that claims 2-4, 7 and 8 stand or fall together with claim 1 from which they depend. However, Applicants submit that claims 1, 23 and 24 are independently patentable from one another, and that claims 12 and 15-22 are independently patentably distinguishable from claim 1 from which they depend. Reasons in support of this independent patentability are set forth in detail below.

B. With respect to issue B. set forth above, Applicants submit that claims 5, 9, 12 and 14 are all independently patentable from one another. Additionally, Applicants submit that claim 6 is independently patentable from claim 5 from which it depends, claims 10 and 11 are each independently patentable from claim 9 from which they depend, and claim 13 is independently patentable from claim 12 from which it depends. Reasons in support of the independent patentability of these claims are set forth in detail below.

VIII. ARGUMENTS

As will be set forth in detail below, the substrates defined by claims 1-4, 7, 8, 12 and 15-24, the article of manufacture defined by claim 23 and the process defined by claim 24 are neither anticipated by nor rendered obvious over Tukumi. Additionally, the substrates

defined by claims 5, 6 and 9-14 are nonobvious over and patentably distinguishable from Tukumi in view of Payet. Accordingly, the rejections under 35 U.S.C. §§ 102 and 103 should be reversed. Favorable action by the Board is respectfully requested.

A. The Invention

According to claim 1, the invention is directed to a substrate comprising fabric. The substrate is treated with a composition comprising a) formaldehyde, b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst. The treated substrate has at least three enhanced fabric benefits selected from the group consisting of i) durable press, as compared with untreated fabric; ii) hand feel, as compared with untreated fabric; iii) anti-abrasion, as compared with fabric treated with formaldehyde and catalyst in the absence of said polyethylene glycol; iv) anti-shrinking, as compared with untreated fabric; and v) anti-yellowing, as compared with at least one of untreated fabric and fabric treated with formaldehyde and catalyst in the absence of said polyethylene glycol.

According to claim 23, the invention is directed to an article of manufacture comprising fabric made up of woven or non-woven fibers. The fabric has at least three enhanced fabric benefits selected from the group consisting of i) durable press, as compared with fabric made up of untreated fibers; ii) hand feel, as compared with fabric made up of untreated fibers; iii) anti-abrasion, as compared with fabric made up of fibers treated with formaldehyde and catalyst in the absence of polyethylene glycol; iv) anti-shrinking, as compared with fabric made up of untreated fibers; and v) anti-yellowing, as compared with at least one of fabric made up of untreated fibers and fabric made up of fibers treated with formaldehyde and catalyst in the absence of polyethylene glycol. The benefits are achieved by treating said fibers with a composition comprising a) formaldehyde, b) polyethylene

glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst.

Finally, according to claim 24, the invention is directed to a process for providing at least three enhanced benefits to a fabric fiber-comprising substrate. The benefits are selected from the group consisting of i) durable press, as compared with untreated fabric fiber-comprising substrate; ii) hand feel, as compared with untreated fabric fiber-comprising substrate; iii) anti-abrasion, as compared with fabric fiber-comprising substrate treated with formaldehyde and catalyst in the absence of polyethylene glycol; iv) anti-shrinking, as compared with untreated fabric fiber-comprising substrate; and v) anti-yellowing, as compared with at least one of untreated fabric fiber-comprising substrate and fabric fiber-comprising substrate treated with formaldehyde and catalyst in the absence of polyethylene glycol. The process comprises the steps of treating a fabric fiber comprising substrate with a composition comprising a) formaldehyde, b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst, and curing said composition on the surface of said substrate.

As set forth in the present specification, for example at page 2, beginning at line 8, many conventional improvements or enhancements to fabric are accompanied by disadvantageous consequences. For example, various processes which provide permanent press properties require strong acidic conditions which can significantly reduce fabric strength. The addition of anti-static or softening agents can cause fabric to prematurely abrade. On the other hand, the present invention provides fabric substrates and articles of manufacture which exhibit combinations of improved properties, so that enhancements are not accompanied by unacceptable fabric property degradation.

B. Claims 1-4, 7, 8, 12 and 15-24 are Neither Anticipated by Nor Rendered Obvious Over Tukumi

The substrates defined by claims 1-4, 7, 8, 12 and 15-22, the article of manufacture defined by claim 23 and the process defined by claim 24 are neither anticipated by nor rendered obvious over Tukumi.

1. The Rejection

In rejecting claims 1-4, 7, 8, 12 and 15-24 as anticipated by or obvious over Tukumi, the Examiner asserted that Takumi discloses a fiber finishing method which includes immersing a cellulosic fabric in a solution of polyethylene glycol having a molecular weight ranging from 90-5000 gm/mol, drying the fabric, exposing the fabric to formaldehyde vapor in the presence of a catalyst and heat curing. The Examiner further asserted that the claimed properties are inherent in the invention of Takumi since Takumi uses like materials and like processes.

2. The Claims are Not Anticipated by Tukumi

Contrary to the Examiner's assertions, Tukumi does not teach like materials and like processes, whereby the Examiner's assumptions regarding the inherency of the presently claimed enhanced benefits in Tukumi are in error.

More particularly, Takumi discloses a method for resin finishing of a fiber product. A cellulosic fiber product is immersed in an aqueous solution of a polyhydric alcohol, uniformly dried, exposed to formaldehyde vapor and then provided with a catalyst such as sulfur dioxide gas and heat treated. Takumi discloses that ethylene glycol or polyethylene glycol having 90-5000 molecular weight are preferred and that the amount of the remaining formaldehyde is suppressed to a low content to provide wrinkle preventing properties and shrink preventing properties without reducing strength.

However, Applicants find no teaching or suggestion by Takumi of a substrate or fibers treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst, as required by claims 1 and 23, respectively. Similarly, Applicants find no teaching or suggestion by Takumi of a process wherein a substrate is treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst, as required by claim 24. Rather, Takumi discloses sequential steps of treatment with a polyhydric alcohol, followed by exposure to formaldehyde vapor, followed by provision of a gaseous catalyst. Thus, contrary to the Examiner's assertions, Takumi does not disclose a like process as Takumi employs a formaldehyde vapor contact step, separate from the polyhydric alcohol treatment step, followed by yet another separate gaseous catalyst treatment step. In fact, in the Official Action dated June 20, 2003, the Examiner admits that Takumi teach a different process (page 3, last line).

One skilled in the art will appreciate that a method as taught by Takumi, wherein polyhydric alcohol treatment is followed by exposure to formaldehyde vapor, followed by gaseous catalyst exposure, can result in differing degrees of formaldehyde crosslinking as the amount of formaldehyde contact with the cellulosic fibers is limited both by the polyhydric alcohol pretreatment and the vapor phase of the formaldehyde. In fact, Takumi indicates that formaldehyde on the product is suppressed to a low amount. Additionally, the extent of crosslinking can be effected by the amount of catalyst contact from the vapor phase. Accordingly, it cannot be assumed that the product of Takumi will have properties exhibited by the presently claimed substrates and articles of manufacture, and particularly at least three enhanced fabric benefits, or that the different process of Takumi will provide such a product.

The Examiner asserted that Applicants are claiming a composition, not the amounts of each constituent used or present in the final product structure. However, Applicants are not merely claiming compositions. To the contrary, Applicants are claiming a substrate comprising fabric (claim 1) or an article of manufacture comprising fibers (claim 23) treated with a composition comprising a) formaldehyde, b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst, and having at least three enhanced fabric benefits selected from a specified group of benefits. The recited benefits result from the specified treatment with the specified composition. Takumi does not teach the treatment composition of claim 1 or claim 23, nor the treatment process of claim 1 or claim 23, nor the combination of benefits required by claim 1 or claim 23. Moreover, Takumi does not teach modifying the disclosed treatment process, particularly to result in a substrate or article of manufacture having the combination of benefits of claim 1 or claim 23. In fact, the modifications of Takumi necessary to result in the limitations of claim 1 or claim 23 are contrary to the sequential steps of Takumi and contrary to the low formaldehyde use obtained by the formaldehyde vapor treatment of Takumi.

Finally, the invention is directed to a process for providing at least three enhanced benefits selected from a specified group to a fabric fiber-comprising substrate by treating a fabric fiber comprising substrate with a composition comprising a) formaldehyde, b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and c) an acid catalyst, and curing said composition on the surface of said substrate (claim 24). Again, Applicants are not merely claiming a composition as asserted by the Examiner. Rather, Applicants are claiming a process to provide specified benefits, which process employs defined steps and composition. Takumi does not teach the process of obtaining the claimed combination of benefits, nor the recited steps, nor the recited treatment composition. Moreover, as noted above, Takumi does not teach modifying the disclosed

sequential treatment process, particularly to result in a fabric substrate having the claimed combination of benefits of claim 24. In fact, as noted above, the modifications of Takumi necessary to result in the process of claim 24 are contrary to the sequential steps of Takumi and contrary to the low formaldehyde use obtained by the formaldehyde vapor treatment of Takumi.

It is not surprising then that Applicants find no teaching or suggestion by Takumi regarding substrates or articles of manufacture as recited in claims 1 and 23, exhibiting at least three enhanced benefits selected from the group consisting of i) durable press, ii) hand feel, iii) anti-abrasion, iv) anti-shrinking, and v) anti-yellowing, or a process for providing such as recited in claim 24. Moreover, in view of the process and compositional differences discussed above, it cannot be assumed that the sequential method and formaldehyde vapor teachings of Takumi inherently result in such a product.

Anticipation under 35 U.S.C. §102 requires that each and every element as set forth in the claims is found, either expressly or inherently described, in a single prior art reference, *In re Robertson*, 49 U.S.P.Q.2d 1949, 1950 (Fed Cir. 1999). In view of the failure of Takumi to disclose substrates or articles treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst as required by the present claims, or provision of at least three enhanced benefits selected from the group consisting of i) durable press, ii) hand feel, iii) anti-abrasion, iv) anti-shrinking, and v) anti-yellowing, Takumi does not expressly or inherently describe each and every element as set forth in the claims. Thus, Takumi does not anticipate claims 1-4, 7, 8, 12 and 15-24 under 35 U.S.C. §102. The rejection of claims 1-4, 7, 8, 12 and 15-24 under 35 U.S.C. §102 should therefore be reversed.

3. The Claims are Not Rendered Obvious by Takumi

In order to render a claimed invention obvious, the prior art must enable one skilled in the art to make and use the claimed invention, *Motorola, Inc. v. Interdigital Tech. Corp.*, 43 U.S.P.Q.2d 1481, 1489 (Fed. Cir. 1997). In view of the failure of Takumi to disclose the treatment composition as presently claimed, a treatment process as presently claimed, or any motivation for modifying the Takumi process to obtain the combinations of benefits as presently claimed in a substrate comprising treated fabric or an article of manufacture comprising fabric made up of woven or non-woven fibers, Takumi does not enable one skilled in the art to make and use the presently claimed invention. In fact, it is error to find obviousness where references diverge from and teach away from the invention at hand, *In re Fine*, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). As the modifications of Takumi necessary to result in the substrate of claim 1, the article of manufacture of claim 23 or the process of claim 24 are contrary to the sequential steps of Takumi and contrary to the low formaldehyde use obtained by the formaldehyde vapor treatment of Takumi, it is error to find the presently claimed invention obvious in view of Takumi. Thus, Takumi does not render claims 1-4, 7, 8, 12 and 15-24 obvious under 35 U.S.C. §103. The rejection of claims 1-4, 7, 8, 12 and 15-24 under 35 U.S.C. §103 should therefore be reversed.

4. Claim 12 is Further Patentably Distinguishable

Claim 12 is directed to a substrate treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst selected from a group consisting of mineral acids, salts of strong acids, organic acids, ammonium salts, alkyl amine salts, and mixtures thereof. Takumi et al disclose a sequential treatment process wherein a dried cloth having been exposed to formaldehyde vapor is provided with a catalyst such as sulfur dioxide gas.

Applicants find no teaching or suggestion by Takumi of substrates treated with a catalyst as required by claim 12.

Thus, Takumi does not disclose each and every element of claim 12 and therefore does not anticipate claim 12 under 35 U.S.C. §102. The rejection of claim 12 under 35 U.S.C. §102 should therefore be reversed.

5. Claims 15-22 are Further Patentably Distinguishable

Claims 15-17 recite that the substrate according to claim 1 has a durable press benefit of about 3, of about 3.25 and of about 3.5, respectively, after one washing. Claims 18-20 recite that the substrate according to claim 1 has a durable press benefit of about 3, of about 3.25 and of about 3.5, respectively, after five washings. Claim 21 recites that the substrate fabric has an anti-shrinkage rating of less than 10% after one washing, while claim 22 recites that the substrate fabric has an anti-shrinkage rate of less than 5% after five washings. Thus, these claims each recite a more specific enhanced benefit which is provided to the substrate in combination with at least two additional benefits as recited in claim 1.

Applicants find no teaching or suggestion by Takumi relating to substrates having the specific benefit defined in any of claims 15-22. Moreover, in view of the differences between the process described by Takumi et al and the process set forth in the present specification, as discussed in detail above, it cannot be assumed that the Takumi process renders the specific benefits recited in each of claims 15-22, particularly in combination with at least two additional enhanced benefits as required by claim 1. Moreover, Applicants find no teaching or suggestion by Takumi which would lead one of ordinary skill in the art to obtain the specific benefits recited in each of claims 15-22, particularly in combination with at least two additional enhanced benefits as recited in claim 1. Thus, Takumi fails to anticipate or render obvious any of the substrates defined by claims 15-22. The rejection of

claims 15-22 under 35 U.S.C. §102 or, in the alternative, under 35 U.S.C. §103, should therefore be reversed.

C. Claim 5, 6 and 9-14 are Nonobvious Over Takumi and Payet

The substrates defined by claims 5, 6 and 9-14 are nonobvious over and patentably distinguishable from the combination of Takumi and Payet.

1. The Rejection

The Examiner asserted that Payet teaches the use of a composition comprising formaldehyde, a catalyst and a silicone elastomer. The Examiner further asserted that it would have been obvious to one skilled in the art to use the specific catalyst of Payet, to use a higher amount of catalyst than taught by Payet, and to use the formaldehyde solution of Payet in the invention of Takumi. In reply to Applicants' previous arguments, the Examiner asserted that Payet teaches using less formaldehyde than other known processes and further teaches removing residual formaldehyde.

2. The Claims are Nonobvious Over Takumi and Payet

Claim 5, 6 and 9-14 depend directly or indirectly from claim 1. The deficiencies of Takumi with respect to claim 1 are discussed in detail above. Specifically, Applicants find no teaching or suggestion by Takumi of a substrate treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst. Similarly, Applicants find no teaching or suggestion by Takumi of a treated substrate having at least three enhanced fabric benefits selected from the group consisting of durable press, hand feel, anti-abrasion, anti-shrinking and anti-yellowing, as recited in claim 1. Moreover, Applicants find no teaching or suggestion by Takumi of the specific limitations of any of claims 5, 6 and 9-14. Further, the deficiencies of Takumi with respect to these claims are not resolved by Payet.

More particularly, claims 5 and 6 are directed to substrates treated with a composition comprising from about 2% to about 12% by weight, and from about 4% to about 8% by weight, respectively, of formaldehyde. Applicants find no teaching by Takumi et al relating to a substrate treated with a composition comprising either from about 2% to about 12% by weight of formaldehyde or from about 4% to about 8% by weight of formaldehyde, particularly in combination with polyethylene glycol and an acid catalyst as required by claims 5 and 6. To the contrary, Takumi teaches sequential treatment steps wherein a formaldehyde vapor is employed subsequent to treatment with a polyethylene glycol or ethylene glycol treatment and prior gaseous catalyst treatment.

Claims 9-11 are directed to substrates treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol and an acid catalyst in the amount of from about 1% to about 12% by weight, from about 1% to about 9% by weight, and from about 5% by weight, respectively. Applicants find no teaching or suggestion by Takumi of a substrate or product treated with such a composition. To the contrary, as noted above, Takumi discloses sequential treatment steps wherein a dried cloth, having been exposed to formaldehyde vapor, is then contacted with a catalyst such as sulfur dioxide gas.

Claims 12 and 13 are directed to substrates treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst selected from a group consisting of mineral acids, salts of strong acids, organic acids, ammonium salts, alkyl amine salts, and mixtures thereof (claim 12), or wherein the catalyst is magnesium chloride, aluminum chloride, citric acid, or mixtures thereof (claim 13). Takumi discloses a sequential treatment process wherein a dried cloth having been exposed to formaldehyde vapor is provided with a catalyst such as sulfur

dioxide gas. Applicants find no teaching or suggestion by Takumi of substrates treated with a catalyst as required by either claim 12 or claim 13.

Finally, claim 14 is directed to a substrate treated with a composition comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, an acid catalyst and from 0.01 to 1% by weight of a nonionic surfactant. Applicants find no teaching or suggestion by Takumi of a substrate treated with such a composition, particularly comprising from 0.01% to 1% by weight of a nonionic surfactant in combination with formaldehyde, polyethylene glycol and an acid catalyst.

These deficiencies of Takumi are not resolved by Payet. Initially, one skilled in the art would not find it obvious to combine the teachings of Payet with Takumi. Particularly, one skilled in the art would not find it obvious to use a liquid formaldehyde treatment solution as taught by Payet in the formaldehyde vapor process of Takumi. That is, Takumi has as an objective to provide a product using formaldehyde vapor to suppress formaldehyde to a low content. Accordingly, use of a liquid formaldehyde treatment solution as taught by Payet would encourage greater formaldehyde-fabric contact and therefore would be contrary to the objective of Takumi. Thus, one skilled in the art would not find it obvious to modify Takumi along the lines asserted by the Examiner and such a modification would be in opposition to the teachings of Takumi. Accordingly, Payet is not properly combinable with and therefore does not resolve the deficiencies of Takumi.

The Examiner has asserted that Payet teaches using less formaldehyde than other known processes and further teaches removing residual formaldehyde. Specifically, Payet teaches that less formaldehyde remains after the treatment process is complete as compared with other known processes (page 8, lines 14-17). Payet does not indicate what other known processes are being compared and specifically Payet does not compare his liquid treatment process with vapor formaldehyde treatment processes as employed by Takumi. To the

contrary, much of the related art described in the background portion of Payet relates to liquid treatments. Thus, Payet provides no teaching or suggestion to motivate one of ordinary skill in the art to employ any of the formaldehyde-containing compositions of Payet in the Takumi process along the lines asserted by the Examiner.

Finally, while Payet discloses compositions of formaldehyde, a catalyst and a silicone elastomer for treatment of fabric, Applicants find no teaching by Payet of compositions comprising formaldehyde, polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol, and an acid catalyst as required by the present claims. Similarly, Applicants find no teaching by Payet of fabric which is treated with such compositions to provide at least three enhanced benefits selected from the group consisting of i) durable press, ii) hand feel, iii) anti-abrasion, iv) anti-shrinking, and v) anti-yellowing, as required by claims 5, 6 and 9-14. Additionally, Applicants find no teaching or suggestion by Payet for modifying the process of Takumi to provide a substrate treated with compositions defined by any of claims 5, 6 and 9-14.

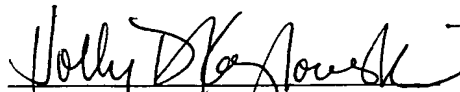
The mere fact that prior art could be modified to result in a claimed invention would not have made the modification obvious unless the prior art suggested the desirability of the modification, *In re Mills*, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990). Applicants find no suggestion in Payet regarding a desirability of modifying Takumi along the lines asserted by the Examiner. Thus, the asserted modifications of Takumi are not rendered obvious by Payet. The substrates of claims 5, 6 and 9-14 are therefore nonobvious over and patentably distinguishable from the combination of Takumi and Payet. Accordingly, the rejection of these claims under 35 U.S.C. §103 should be reversed.

IV. CONCLUSIONS

For the reasons discussed in detail above, Applicants submit that the substrates, article of manufacture and processes defined by claims 1-24 are neither anticipated by nor rendered

obvious over Takumi, or Takumi in combination with Payet. Accordingly, the rejection of claims 1-4, 7, 8, 12 and 15-24 under 35 U.S.C. §102 or §103 and the rejection of claims 5, 6 and 9-14 under 35 U.S.C. §103 should be reversed. Favorable action by the Board is respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Holly D. Kozlowski", written over a horizontal line.

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APPENDIX

1. A substrate comprising fabric, the substrate treated with a composition comprising:

- a) formaldehyde;
- b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol; and
- c) an acid catalyst;

wherein the treated substrate has at least three enhanced fabric benefits, said benefits selected from the group consisting of:

- i) durable press, as compared with untreated fabric;
- ii) hand feel, as compared with untreated fabric;
- iii) anti-abrasion, as compared with fabric treated with formaldehyde and catalyst in the absence of said polyethylene glycol;
- iv) anti-shrinking, as compared with untreated fabric; and
- v) anti-yellowing, as compared with at least one of untreated fabric and fabric treated with formaldehyde and catalyst in the absence of said polyethylene glycol.

2. A substrate according to Claim 1 wherein said composition comprises polyethylene glycol having a molecular weight of from about 800 gm/mol to about 1900 gm/mol.

3. A substrate according to Claim 2 wherein said composition comprises polyethylene glycol having a molecular weight of from about 900 gm/mol to about 1200 gm/mol.

4. A substrate according to Claim 3 wherein said composition comprises polyethylene glycol having a molecular weight of about 1000 gm/mol.

5. A substrate according to Claim 1 wherein said composition comprises from about 2% to about 12% by weight, of formaldehyde.

6. A substrate according to Claim 5 wherein said composition comprises from about 4% to about 8% by weight, of formaldehyde.

7. A substrate according to Claim 1 wherein said composition comprises from about 1% to about 10% by weight, of polyethylene glycol.

8. A substrate according to Claim 7 wherein said composition comprises from about 2% to about 8% by weight, of polyethylene glycol.

9. A substrate according to Claim 1 wherein said composition comprises from about 1% to about 12% by weight, of said catalyst.

10. A substrate according to Claim 9 wherein said composition comprises from about 1% to about 9% by weight, of said catalyst.

11. A substrate according to Claim 10 wherein said composition comprises about 5% by weight, of said catalyst.

12. A substrate according to Claim 1 wherein said catalyst is selected from the group consisting of mineral acids, salts of strong acids, organic acids, ammonium salts, alkylamine salts, and mixtures thereof.

13. A substrate according to Claim 12 wherein said catalyst is magnesium chloride, aluminum chloride, citric acid, or mixtures thereof.

14. A substrate according to Claim 1 wherein said composition further comprises from 0.01% to 1% by weight, of a nonionic surfactant.

15. A substrate according to Claim 1 having a durable press benefit of about 3 after 1 washing.

16. A substrate according to Claim 15 having a durable press benefit of about 3.25 after 1 washing.

17. A substrate according to Claim 16 having a durable press benefit of about 3.5 after 1 washing.

18. A substrate according to Claim 1 having a durable press benefit of about 3 after 5 washings.

19. A substrate according to Claim 18 having a durable press benefit of about 3.25 after 5 washings.

20. A substrate according to Claim 19 having a durable press benefit of about 3.5 after 5 washings.

21. A substrate according to Claim 1 wherein said fabric has a Anti-shrinkage Rating of less than 10% after 1 washing.

22. A substrate according to Claim 21 wherein said fabric has a Anti-shrinkage Rating of less than 5% after 5 washings.

23. An article of manufacture comprising fabric made up of woven or non-woven fibers, the fabric having at least three enhanced fabric benefits, said benefits selected from the group consisting of:

- i) durable press, as compared with fabric made up of untreated fibers;
- ii) hand feel, as compared with fabric made up of untreated fibers;
- iii) anti-abrasion, as compared with fabric made up of fibers treated with formaldehyde and catalyst in the absence of polyethylene glycol;

- iv) anti-shrinking, as compared with fabric made up of untreated fibers;

and

- v) anti-yellowing, as compared with at least one of fabric made up of untreated fibers and fabric made up of fibers treated with formaldehyde and catalyst in the absence of polyethylene glycol;

wherein said benefits are achieved by treating said fibers with a composition comprising:

- a) formaldehyde;

b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol; and

c) an acid catalyst.

24. A process for providing at least three enhanced benefits to a fabric fiber-comprising substrate, said benefits selected from the group consisting of:

i) durable press, as compared with untreated fabric fiber-comprising substrate;

ii) hand feel, as compared with untreated fabric fiber-comprising substrate;

iii) anti-abrasion, as compared with fabric fiber-comprising substrate treated with formaldehyde and catalyst in the absence of polyethylene glycol;

iv) anti-shrinking, as compared with untreated fabric fiber-comprising substrate; and

v) anti-yellowing, as compared with at least one of untreated fabric fiber-comprising substrate and fabric fiber-comprising substrate treated with formaldehyde and catalyst in the absence of polyethylene glycol;

wherein said process comprises the steps of:

A) treating a fabric fiber-comprising substrate with a composition comprising:

a) formaldehyde;

b) polyethylene glycol having a molecular weight of from about 700 gm/mol to about 2500 gm/mol; and

c) an acid catalyst; and

B) curing said composition on the surface of said substrate.